

IN THE CLAIMS

1. (Currently amended) A hybrid optical device comprising:
a first set of one or more input optical channels that convey one or more beams of radiation;
a second set of one or more output optical channels which receive radiation from said one or more beams;
a filter passing at least one first portion of the one or more beams from selected channel(s) of the first set and reflecting at least one second portion of the one or more beams;
a reflective surface reflecting at least some of the radiation in said at least one first portion; and

an actuator that ~~rotates~~moves said surface -about one or more axes transverse to the one or more beams to each of a plurality of positions so that the one or more beams travel from selected channel(s) of said first set to selected channel(s) of said second set, wherein said surface at each of the plurality of positions ~~reflects~~causes substantially all of a selected corresponding portion of the radiation passed by the filter, and to be directed to directs a selected corresponding portion of the reflected radiation to the selected channel(s) in the second set.

2. (Original) The device of claim 1, wherein said filter reflects a selected portion of each of wavelength components in the radiation in at least one of the beam(s) and passes the remainder of such wavelength components.

3-5. (Cancelled)

6. (Original) The device of claim 2, wherein said surface at each of the plurality of positions causes substantially all of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set.

7. (Original) The device of claim 2, wherein said surface at the plurality of positions causes different intensities of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set.

8. (Original) The device of claim 1, wherein said filter is a bandpass filter that reflects wavelength components of the radiation in at least one of the beam(s) from the first set having wavelengths outside its passband and passes wavelength components of the radiation in the beam(s) having wavelengths within its passband.

9-11. (Cancelled)

12. (Original) The device of claim 8, wherein said surface at each of the plurality of positions causes substantially all of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set.

13. (Original) The device of claim 8, wherein said surface at the plurality of positions causes different intensities of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set.

14. (Original) The device of claim 1, wherein a total number of optical channels of said first set and said second set together is more than two.

15. (Original) The device of claim 1, wherein a first of the plurality of positions corresponds to a first combination of optical paths through which said beam(s) travels from said first set to said second set, and a second of the plurality of positions corresponds to a second combination of optical paths through which said beam(s) travels from said first set to said second set, wherein said first combination is different from said second combination, so that the device acts as a switch when the actuator moves the surface between the first and second of the plurality of positions.

16. (Original) The device of claim 15, wherein said surface at the first and second of the plurality of positions causes substantially all of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set.

17. (Original) The device of claim 15, wherein said surface at the first and second of the plurality of positions causes different intensities of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set so that the device acts as a switch/attenuator.

18-25. (Cancelled)

26. (Original) The device of claim 1, further comprising an optical element in an optical path between the first and second sets, said element focusing said one or more beams from the first set and to the second set.

27 (Original) The device of claim 1, further comprising:
a ferrule which supports said first set and said second set;
a package encasing said surface and said actuator; and
a transparent window on said package.

28 (Original) The device of claim 1, further comprising a gradient index lens between the input and output channels on one hand and the filter and the surface on the other.

29. (Original) The device of claim 1, wherein said actuator moves said surface by electrostatic force.

30. (Original) The device of claim 1, further comprising a silicon substrate, said surface and said actuator being connected to or forming a part of the silicon substrate.

31. (Cancelled)

32. (Original) The device of claim 1, said actuator comprising a plurality of interdigitated fingers.

33. (Original) The device of claim 1, wherein said filter and surface are such that the input and output channels are bi-directional.

34. (Cancelled)

35. (Cancelled)

36. (Original) The device of claim 1, said first set comprising two input channels and said second set comprising two output channels.

37-46. (Cancelled)

47. (Currently Amended) A hybrid optical device comprising:
a first set of one or more input optical channels that convey one or more beams of radiation;
a second set of one or more output optical channels which receive radiation from said one or more beams;
a filter passing at least one first portion of the one or more beams from selected channel(s) of the first set and reflecting at least one second portion of the one or more beams;
a reflective surface reflecting at least some of the radiation in said at least one first portion; and
an actuator that ~~rotates~~moves said filter about one or more axes transverse to the one or more beams to each of a plurality of positions so that the one or more beams travel from selected channel(s) of said first set to selected channel(s) of said second set, wherein

said filter at each of the plurality of positions causes a selected corresponding portion of the radiation to be directed to the selected channel(s) in the second set.

48. (Currently Amended) A method for optical transmission, comprising:
conveying one or more beams of radiation through a first set of one or more input optical channels;

passing at least one first portion of the one or more beams from the first set and reflecting at least one second portion of the one or more beams by means of a filter;

reflecting at least some of the radiation in said at least one first portion by means of a reflective surface; and

~~rotating~~moving said surface about one or more axes transverse to the one or more beams to each of a plurality of positions so that the radiation reflected by the filter and the surface is directed to selected channel(s) in a second set of one or more output optical channels, wherein said surface at each of the plurality of positions ~~reflects~~causes substantially all a selected corresponding part of the radiation passed by the filter, and directs a selected corresponding portion of the reflected radiation ~~to be directed to the~~ selected channel(s) in the second set.

49. (Currently Amended) A method for optical transmission, comprising:
conveying one or more beams of radiation to a first set of one or more input optical channels;

passing at least one first portion of the one or more beams from the first set and reflecting at least one second portion of the one or more beams by means of a filter;

reflecting at least some of the radiation in said at least one first portion by means of a reflective surface; and

~~rotating~~moving said filter about one or more axes transverse to the one or more beams to each of a plurality of positions so that the radiation reflected by the filter and the surface is directed to selected channel(s) in a second set of one or more output optical channels, wherein said filter at each of the plurality of positions causes a selected corresponding portion of the radiation reflected by the filter to be directed to the selected channel(s) in the second set.